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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/997,701	11/30/2001	Henry Yue	PF-0631-2 DIV	5300

27904 7590 02/26/2004

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EXAMINER	
VANDERVEGT, FRANCOIS P	
ART UNIT	**PAPER NUMBER**
1644	

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/997,701	YUE ET AL.	
	Examiner	Art Unit	
	F. Pierre VanderVegt	1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,11,30-45,56 and 57* is/are pending in the application.

4a) Of the above claim(s) *1,2,56 and 57* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11 and 30-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11302001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Examiner in charge of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to F. Pierre VanderVegt, Ph.D. in Art Unit 1644.

This application is a divisional of U.S. Application Serial Number 09/470,946, which is a divisional of U.S. Application Serial Number 09/187,331.

Claims 3-10, 12-29, 46-55 and 58-59 have been canceled.

Claims 1, 2, 11. 30-45, 56 and 57 are currently pending.

Election/Restrictions

1. Applicant's election with traverse of Group 7, claims 11 and 30-45, in the Paper filed November 13, 2003 is acknowledged. The traversal is on the ground(s) that it would not pose an undue burden on the Examiner to search the polypeptide of Group I in addition to the antibody of Group 7. This is not found persuasive because antibodies to a protein bind to an epitope of the polypeptide, not the full length. Accordingly, determination of whether antibodies bind to the polypeptide of SEQ ID NO: 1, does not require the determination of the novelty of the polypeptide of SEQ ID NO: 1.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 30, 33 and 35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are drawn to diagnostic tests for conditions or diseases associated with the expression of SEQ ID NO: 1 using antibodies to SEQ ID NO: 1. The specification asserts that the discovery of new

cell surface glycoproteins satisfies a need in the art by providing new compositions that are useful in the diagnosis, prevention, and treatment of hematologic, karyotypic, and neuronal disorders (page 3, lines 10-12 for example). However, the application does not identify a single disease condition where the expression of SEQ ID NO: 1 or a biological activity of SEQ ID NO: 1 may be a relevant factor or useful for the diagnosis of that disorder.

Reasonable correlation must exist between the scope of the claims and scope of enablement set forth. However, the specification discloses only two examples of a polypeptide that is naturally-occurring and has at least 90% identity to SEQ ID NO: 1; namely, the polypeptide of SEQ ID NO:1 and the PBDX protein taught by Ellis et al. (Nature Genetics [1994] 6:394-400; 2 on form PTO-1449) , later identified as the blood group antigen Xg^a Ellis (Nature Genetics [1994] 8:285-290; 3 on form PTO-1449), which is 92.3% identical to SEQ ID NO: 1. However, even a function for Xg^a has not been identified. Ellis (Nature Genetics [1994] 8:285-290; 3 on form PTO-1449) discloses that Xg^a is 48% homologous, including conservative changes, to CD99 and concludes that Xg^a and CD99 are structurally related and therefore "may have a similar function." However, Ellis goes on to say that although CD99 is expressed abundantly on hematopoietic precursor cells and high levels of CD99 constitute a tumor marker for Ewing's sarcoma, "The exact biological function of CD99 is still obscure" (paragraph bridging pages 288-289 in particular). Ellis further discloses that expression of Xg^a is correlated with the expression of CD99. However, while the expression of CD99 has been tied to a particular type of sarcoma, no such correlation has been identified for Xg^a (Ellis - Nature Genetics [1994] 8:285-290; Table 3 in particular). Accordingly, since the identification of SEQ ID NO: 1 as a cell surface marker protein relies solely on it's "significant" identity with Xg^a, not on an actual elucidation of diseases or conditions in which SEQ ID NO: 1 expression or activity is relevant, diagnosis of any condition or disease based upon the expression of SEQ ID NO: 1 is not enabled. Based upon the paucity of guidance from the instant specification and the lack of predictability based upon the state of the art at the time the invention was made, the artisan would not be able to practice the claimed method of diagnosing a condition or disease related to expression of SEQ ID NO: 1 because the artisan would not be able to identify even a single related condition or disease. Therefore, the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue with respect to other diagnosing a condition or disease related to expression of SEQ ID NO: 1.

In view of the limited working examples, the unpredictability of the art, the lack of sufficient guidance in the specification and the breadth of the claims, it would take undue trials and errors to practice the claimed invention and the statute does not sanction this.

3. Claims 11 and 30-45 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims recite as part of the invention an antibody which specifically binds a polypeptide comprising a "naturally-occurring amino acid sequence at least 90% identical to the amino acid sequence of SEQ ID NO: 1" and to a "biologically active fragment" of the polypeptide of SEQ ID NO: 1.

A polypeptide comprising the amino acid sequence of SEQ ID NO: 1 is adequately described in the specification as-filed, thereby providing an adequate written description of an antibody which specifically binds the polypeptide of SEQ ID NO:1 or immunogenic fragments thereof.

A polypeptide comprising a "naturally-occurring amino acid sequence at least 90% identical to the amino acid sequence of SEQ ID NO:1" is a recitation of a genus of polypeptides for which Applicant has disclosed only two species: the polypeptide of SEQ ID NO:1 and the XG protein taught by Ellis et al. (Nature Genetics [1994] 8:285-290; 3 on form PTO-1449), which is 92.3% identical to SEQ ID NO: 1. The sequence recited in claim 1 of SEQ ID NO: 1 is 195 amino acid residues in length. Assuming that the 90% identical peptides are limited to a similar length of 195 amino acids and using only the 20 naturally occurring amino acid residues, the claim includes all peptides that have up to 19 amino acid changes, resulting in a genus encompassing more than 3.76×10^{25} (19^{20}) different polypeptides. However, Applicant does not appear to have provided a description of which polypeptide sequences are "naturally-occurring", even among those polypeptides at least 90% identical to the full length of the sequence of SEQ ID NO: 1.

Neither does Applicant appear to have provided a description of a biological activity of SEQ ID NO: 1 or fragments thereof, even for those polypeptides at least 90% identical to the full length of the sequence of SEQ ID NO: 1. as stated supra, the identification of SEQ ID NO: 1 is based upon its "significant" identity to the XG protein taught by Ellis. However, even Ellis has not identified a function for XG. Ellis (Nature Genetics [1994] 8:285-290; 3 on form PTO-1449) discloses that XG is 48% homologous, including conservative changes, to CD99 and concludes that XG and CD99 are structurally related and therefore "may have a similar function." However, Ellis goes on to say that although CD99 is expressed abundantly on hematopoietic precursor cells and high levels of CD99 constitute a tumor marker for Ewing's sarcoma, "The exact biological function of CD99 is still obscure" (paragraph bridging pages 288-289 in particular). Thus neither the common attributes of the genus nor the identifying attributes of individual species other than SEQ ID NO: 1 appear to have been described.

One of skill in the art would conclude that Applicant was not in possession of the claimed genera of polypeptides comprising a "naturally-occurring amino acid sequence at least 90% identical to the amino acid sequence of SEQ ID NO:1" and "biologically active fragments of a polypeptide having the amino acid sequence of SEQ ID NO: 1." Since Applicant does not appear to have been in possession of the genus of polypeptides to which the instantly recited antibody specifically binds; Applicant in turn does not appear to be in possession of the genus of antibodies specifically binding these polypeptides.

Therefore, only an antibody to SEQ ID NO: 1 or immunogenic fragments thereof meet the written description provision of 35 U.S.C. 112, first paragraph. Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.). Consequently, Applicant was not in possession of the instant claimed invention. See University of California v. Eli Lilly and Co. 43 USPQ2d 1398.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11, 31, 32, 34 and 36- 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Ellis et al. (Nature Genetics [1994] 8:285-290; 3 on form PTO-1449).

Ellis teaches the making of polyclonal rabbit and monoclonal murine antibodies to PBDX by immunizing animals with the immunogenic N-terminal peptide (not including the leader sequence) QRDFDLADALDDP with a C-terminal cysteine residue attached to cross-link the peptide to a thyroglobulin carrier (paragraph bridging pages 285-286 and page 289, first column in particular). Ellis teaches that the antibodies bind to PBDX protein and identify it as the naturally-occurring Xg^a blood group antigen (Abstract in particular). The prior art teaching anticipates the claimed invention.

Claims 42 and 43 are included because the claims are drawn to a specific product and are drafted in a product-by-process manner. The patentability of a product-by-process claim is determined by the

novelty and nonobviousness of the claimed product itself without consideration of the process for making it which is recited in the claim (see *In re* Thorpe, 227 USPQ 964 (Fed. Cir. 1985)).

Conclusion

5. No claim is allowed.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F. Pierre VanderVegt whose telephone number is (571) 272-0852. The examiner can normally be reached on M-Th 6:30-4:00; Alternate Fridays 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on (571) 272-0841. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

F. Pierre VanderVegt, Ph.D.
Patent Examiner
February 23, 2004

PATRICK J. NOLAN, PH.D.
PRIMARY EXAMINER
2/23/04